Simulasi Numerik Aliran Akibat Keruntuhan Bendungan dengan Menggunakan Persamaan Boussinesq

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ABSTRAK

Permukaan air akibat adanya keruntuhan bendungan disimulasi secara numerik dengan menggunakan persamaan Boussinesq satu dimensi dalam skripsi ini. Persamaan pembangun tersebut didiskritisasi dengan menggunakan metode MacCormack skema 2-6. Simulasi ini dilakukan untuk memprediksi gambaran permukaan air akibat keruntuhan bendungan. Hasil menunjukkan bahwa permukaan air tidak langsung membentuk kemiringan yang terjal saat bendungan runtuh, namun permukaannya membentuk suatu luapan air besar yang menuju hilir. Selanjutnya, hasil dibandingkan untuk menyatakan kontribusi dari suku-suku Boussinesq dan untuk menyelidiki efek distribusi tekanan tidak hidrostatis, dimana suku-suku Boussinesq tersebut membentuk suatu gangguan aliran sebagai akibat dari runtuhnya bendungan.

Kata Kunci: Keruntuhan bendungan, persamaan Boussinesq, metode MacCormack, aliran air, simulasi.

ABSTRACT

Surface water due to dam break is simulated numerically by solving the one-dimensional Boussinesq equation in this final project. The governing equations is discritized by using 2-6 scheme MacCormack Method. The simulation is conducted to predict the image of surface water dam break. The result shows that surface water is indirect to produce a steep slope when the dam fall out, but the

surface produces a large water overflow to go in the downstream. Furthermore, the results are compared to reveal the contribution of Boussinesq terms and to investigate the effect of nonhydrostatic pressure distribution, where the Boussinesq terms produce the flow noice as the effect of dam break.

Keyword: Dam break, Boussinesq equations, MacCormack method, water flow, simulation.

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